

MAI-14602/16  
30807gs/am

#### CLAIMS

- 1           1.     A piston pin having a low friction coating thereupon, said  
2     coating comprising:  
3               a vapor deposited coating of a compound of a metal, said compound  
4     being selected from the group consisting of: carbides, nitrides, oxynitrides,  
5     carbonitrides, sulfides, and mixtures thereof.
- 1           2.     The piston pin of claim 1, wherein said metal is a group  
2     IVA-VIA metal.
- 1           3.     The piston pin of claim 1, wherein said metal is chromium.
- 1           4.     The piston pin of claim 1, wherein said vapor deposited coating  
2     is a coating of chromium nitride.
- 1           5.     The piston pin of claim 1, wherein said vapor deposited coating  
2     is polished.
- 1           6.     The piston pin of claim 1 wherein the coating is deposited as a  
2     plurality of layers.

1           7.     The piston pin of claim 1 wherein the coating is formed a  
2     plurality of layers of different compounds selected from the group consisting of  
3     carbides, nitrides, oxynitrides, carbonitrides, sulfides, and mixtures thereof.

1           8.     The piston pin of claim 1, wherein said vapor deposited coating  
2     is a coating which is deposited by a process selected from the group consisting  
3     of: physical vapor deposition, chemical vapor deposition, evaporation, plasma  
4     assisted chemical vapor deposition, arc vapor deposition, and combinations  
5     thereof.

1           9.     A piston assembly for an internal combustion engine of the type  
2     in which a piston is connected to a connecting rod by means of a piston pin,  
3     wherein the improvement comprises:

4                 at least a portion of one of said piston pin and connecting rod being  
5     coated with a vapor deposited coating of a compound of a metal, said  
6     compound being selected from the group consisting of: carbides, nitrides,  
7     oxynitrides, carbonitrides, sulfides, and mixtures thereof.

1           10.    The piston assembly of claim 9, wherein said metal is a group  
2     IVA-VIA metal.

1           11.    The piston assembly of claim 9, wherein said compound is  
2     chromium nitride.

1           12.    The piston assembly of claim 9, wherein said coating is a  
2   polished coating.

1           13.    The piston assembly of claim 9 wherein the coating is deposited  
2   as a plurality of layers.

1           14.    The piston assembly of claim 9 wherein the coating is formed a  
2   plurality of layers of different compounds selected from the group consisting of  
3   carbides, nitrides, oxynitrides, carbonitrides, sulfides, and mixtures thereof.

1           15.    An internal combustion engine wherein at least a portion of a  
2   component thereof which is in sliding contact with another component thereof  
3   is coated with a vapor deposited coating comprised of a compound of a metal,  
4   said compound being selected from the group consisting of: carbides, nitrides,  
5   oxynitrides, carbonitrides, sulfides, and mixtures thereof.

1           16.    A method for decreasing friction in an internal combustion  
2   engine, said method comprising coating at least a portion of a surface of one  
3   component thereof, which is in sliding contact with another component thereof,  
4   with a vapor deposited coating comprising a compound of a metal, said  
5   compound being selected from the group consisting of carbides, nitrides,  
6   oxynitrides, carbonitrides, sulfides, and mixtures thereof.

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1           17.    The method of claim 16, wherein said step of coating at least a  
2           portion of a surface of a component comprises coating said at least a portion of  
3           said surface in a vapor deposition process.

1           18.    The method of claim 17, wherein said vapor deposition process  
2           is selected from the group consisting of physical vapor deposition, chemical  
3           vapor deposition, evaporation, plasma assisted chemical vapor deposition, arc  
4           vapor deposition, and combinations thereof.

1           19.    The method of claim 16, wherein said component comprises a  
2           piston pin.

1           20.    The method of claim 16, wherein said component comprises a  
2           connecting rod.